

## CLAIMS

1. A polishing apparatus comprising:

a housing for forming a polishing chamber therein;

5 a rotational table for holding and rotating a substrate, said rotational table being disposed inside said polishing chamber;

a polishing tape supply mechanism for supplying a polishing tape to said polishing chamber and taking up said polishing tape which has been supplied to said polishing chamber;

10 a polishing head for pressing said polishing tape against a bevel portion of the substrate;

a liquid supply for supplying a liquid to a front surface and a rear surface of the substrate; and

a regulation mechanism for making an internal pressure of said polishing chamber being set to be lower than an external pressure of said polishing chamber;

15 wherein said polishing tape supply mechanism is disposed outside said polishing chamber.

2. A polishing apparatus according to claim 1, further comprising an oscillation mechanism for vertically swinging said polishing head about the bevel portion of the substrate,

20 wherein said oscillation mechanism is disposed outside said polishing chamber.

25 3. A polishing apparatus according to claim 1, further comprising a relative movement mechanism for moving said polishing head and the substrate relative to each other in a tangential direction of the substrate,

wherein said relative movement mechanism is disposed outside said polishing chamber.

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4. A polishing apparatus according to claim 1, further comprising:  
an oscillation mechanism for vertically swinging said polishing head about the  
bevel portion of the substrate; and

5 a relative movement mechanism for moving said polishing head and the  
substrate relative to each other in a tangential direction of the substrate;  
wherein said oscillation mechanism and said relative movement mechanism  
are disposed outside said polishing chamber.

10 5. A polishing apparatus according to any one of claims 1 to 4, wherein said  
liquid supply comprises a first nozzle for supplying a liquid to a portion of contact  
between said polishing tape and the substrate, a second nozzle for supplying a liquid to  
the substrate so as to form a liquid film over the front surface of the substrate, and a  
third nozzle for supplying a liquid to the rear surface of the substrate.

15 6. A polishing apparatus according to any one of claims 1 to 5, further  
comprising a positioning mechanism for centering the substrate on said rotational  
table,

20 wherein said positioning mechanism comprises a pair of arms which are  
movable in parallel with each other, and an arm drive mechanism for moving said arms  
closer to and away from each other, and each of said arms has at least two contact  
members which are brought into contact with the bevel portion of the substrate.

25 7. A polishing apparatus according to any one of claims 1 to 6, further  
comprising an end point detector for detecting a polishing end point.

8. A polishing apparatus according to claim 7, wherein said end point detector  
comprises an image sensor for taking an image of a polished portion of the substrate,  
and a controller for determining a condition of the polished portion by analyzing the  
image obtained by said image sensor.

30 9. A polishing apparatus according to any one of claims 1 to 8, wherein said  
polishing head comprises an ultrasonic vibrator.

10. A polishing apparatus according to any one of claims 1 to 9, further comprising a pure water ejector for ejecting pure water into said polishing chamber so as to clean said polishing chamber.

5           11. A substrate processing apparatus comprising:  
a polishing unit for polishing a bevel portion of a substrate by bringing a polishing tape into sliding contact with the bevel portion of the substrate;  
a cleaning unit for cleaning at least the bevel portion of the substrate; and  
10           a drying unit for drying the substrate which has been cleaned by said cleaning unit.

12. A substrate processing apparatus according to claim 11, wherein said polishing unit brings said polishing tape into sliding contact with the bevel portion and an edge portion of the substrate so as to polish the bevel portion and the edge portion.

15           13. A substrate processing apparatus according to claim 11 or 12, wherein said polishing unit brings a polishing tape into sliding contact with a notch portion of the substrate so as to polish the notch portion.

20           14. A substrate processing apparatus according to any one of claims 11 to 13, further comprising a partition which divides an internal space of said substrate processing apparatus into a polishing area for polishing the substrate and a cleaning area for cleaning the substrate, an internal pressure of said polishing area being set to be lower than an internal pressure of said cleaning area.

25           15. A substrate processing apparatus according to claim 14, further comprising a fan unit for forming a downward current of a clean gas in said cleaning area.

30           16. A substrate processing apparatus according to any one of claims 11 to 15, further comprising a chemical mechanical polishing unit for polishing a surface of the substrate by pressing the substrate against a polishing table.

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original claims 11 is amended ;  
original claims 1-10, and 12 - 16 are unchanged (2 pages)]

10. A polishing apparatus according to any one of claims 1 to 9, further comprising a pure water ejector for ejecting pure water into said polishing chamber so as to clean said polishing chamber.

5           11. (Amended) A substrate processing apparatus comprising:  
a polishing unit for polishing a bevel portion of a substrate by bringing a  
polishing tape into sliding contact with the bevel portion of the substrate;  
a cleaning unit for cleaning at least the bevel portion of the substrate; and  
10           a drying unit for drying the substrate which has been cleaned by said cleaning  
unit;

wherein said polishing unit has a polishing chamber therein, and an internal pressure of said polishing chamber is set to be lower than an external pressure of said polishing chamber.

15           12. A substrate processing apparatus according to claim 11, wherein said polishing unit brings said polishing tape into sliding contact with the bevel portion and an edge portion of the substrate so as to polish the bevel portion and the edge portion.

20           13. A substrate processing apparatus according to claim 11 or 12, wherein said polishing unit brings a polishing tape into sliding contact with a notch portion of the substrate so as to polish the notch portion.

25           14. A substrate processing apparatus according to any one of claims 11 to 13, further comprising a partition which divides an internal space of said substrate processing apparatus into a polishing area for polishing the substrate and a cleaning area for cleaning the substrate, an internal pressure of said polishing area being set to be lower than an internal pressure of said cleaning area.

30           15. A substrate processing apparatus according to claim 14, further comprising a fan unit for forming a downward current of a clean gas in said cleaning area.

16. A substrate processing apparatus according to any one of claims 11 to 15, further comprising a chemical mechanical polishing unit for polishing a surface of the

substrate by pressing the substrate against a polishing table.